Uninterruptible Power Supply-UPS

NST3 1KVA-6KVA

USER MANUAL

1.Safety Instructions

Please read the FOLLOWING user manual and the safety instructions before installing the unit and starting it up!

1.1 Transport

★ Please transport the UPS system only in the original packaging (to protect against shock and impact).

1.2 Set-up

★ Condensation may occur if the UPS system is moved directly from a cold to a warm environment. The UPS system must be absolutely dry before being installed. Please allow an acclimatization time of at least two hours.

★ Do not install the UPS system near water or in damp environments.

★ Do not install the UPS system where it would be exposed to direct sunlight or near heat.

★ Do not block off ventilation openings in the UPS system's housing.

1.3 Installation

★ Do not connect appliances or items of equipment which would overload the UPS system (e.g. laser printers) to the UPS outlet socket

★ Place cables in such a way that no one can step on or trip over them.

★ Do not connect domestic appliances such as hair dryers to UPS output sockets.

★ The UPS can be operated by any individuals with no previous experience

★ Connect the UPS system only to an earthed shockproof socket outlet.

★ The building wiring socket outlet (shockproof socket outlet) must be easily accessible and close to the UPS system.

★ Please use only VDE-tested, CE-marked mains cable (e.g. the mains cable of your computer) to connect the UPS system to the building wiring socket outlet (shockproof socket outlet).

★ Please use only VDE-tested, CE-marked power cables to connect the loads to the UPS system.

★ This is operator installable.

★ When installing the equipment, it should ensure that the sum of the leakage current of the

UPS and the connected consumer does not exceed 3.5mA.

1.4 Operation

★ Do not disconnect the mains cable on the UPS system or the building wiring socket outlet (shockproof socket outlet) during operations since this would cancel the protective earthing of the UPS system and of all connected loads.

★ The UPS system features its own, internal current source (batteries). The UPS output sockets or output terminals block may be electrically lived even if the UPS system is not connected to the building wiring socket outlet.

★ In order to fully disconnect the UPS system, first press the Standby switch then disconnect the mains lead

★ Ensure that no fluids or other foreign objects can enter the UPS system.

★ The UPS operates with hazardous voltages. Only qualified maintenance personnel may carry out repairs

1.5 Maintenance, servicing and faults

★ The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.

★ Caution - risk of electric shock. Even after the unit is disconnected from the mains power supply (building wiring socket outlet), components inside the UPS system are still connected to the battery and are still electrically live and dangerous.

★ Before carrying out any kind of servicing and/or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exist in the terminals of high capability capacitor such as BUS-capacitors.

★ Only persons are adequately familiar with batteries and with the required precautionary measures may replace batteries and supervise operations. Unauthorised persons must be kept well away from the batteries.

★ Caution - risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Before touching, please verify that no voltage is present!

★ Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other measures necessary when working with batteries:

remove wristwatches, rings and other metal objects
use only tools with insulated grips and handles.

★ When changing batteries, install the same number and same type of batteries.

★ Do not attempt to dispose of batteries by burning them. This could cause battery explosion.

★ Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.

★ Please replace the fuse only by a fuse of the same type and of the same amperage in order to avoid fire hazards.

★ Do not dismantle the UPS system.

2. Description of commonly used notations

Some or all of the following Notations may be used in this manual and may appear in your application process. Therefore, all users should be familiar with them and understand their explanations.

Notation and Explanation	
Notation	Explanation
	Alert you to pay special attention
	Caution of high voltage
	Turn on the UPS
	Turn off the UPS
	Idle or shut down the UPS
	Alternating current source (AC)
	Direct current source (DC)
	Protective ground
	Alarm silence
	Overload indication
	Battery check
	Recycle
	Keep UPS in a clear area

3. Introduction

This On-Line-Series is an uninterruptible power supply incorporating double-converter technology. It provides perfect protection specifically for Novell, Windows NT and UNIX servers.

The double-converter principle eliminates all mains power disturbances. A rectifier converts the alternating current from the socket outlet to direct current. This direct current charges the batteries and powers the inverter. On the basis of this DC voltage, the inverter generates a sinusoidal AC voltage, which permanently supplies the loads.

Computers and periphery are thus powered entirely by the mains voltage. In the event of power failure, the maintenance-free batteries power the inverter.

This manual covers the UPS listed as follows. Please confirm whether it is the model you intend to purchase by performing a visual inspection of the Model No. on the rear panel of the UPS.

Model No. Std	Model No. Long back
NST3100010	NST3100010-L
NST3100020	NST3100020-L
NST3100030	NST3100030-L
NST3100050	NST3100050-L
NST3100060	NST3100060-L

Remark

"L" Model: Long backup time

4. System Description

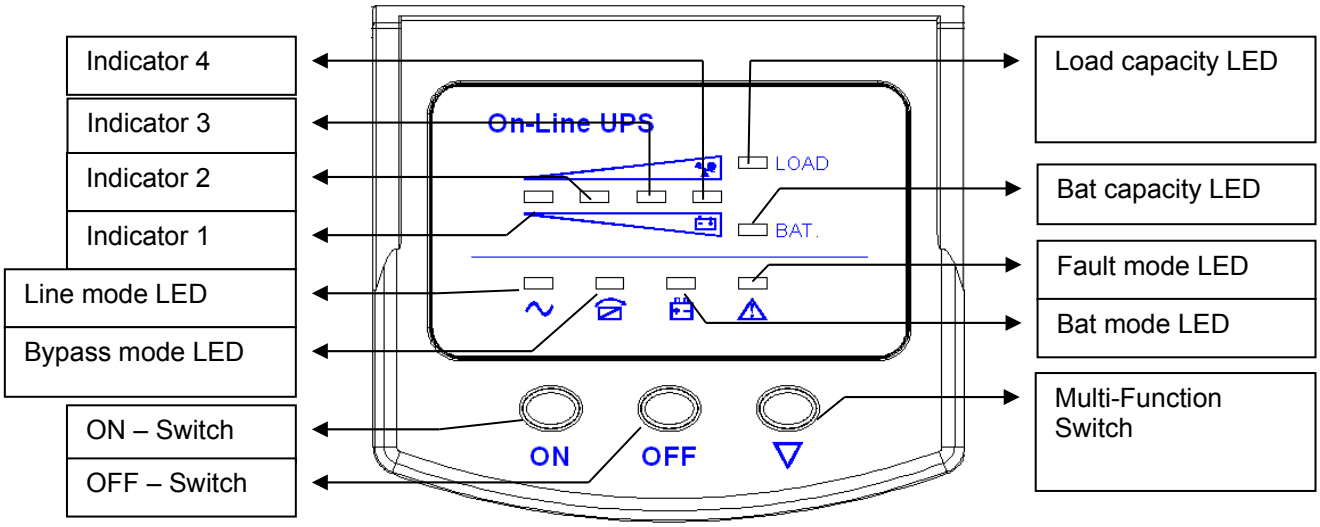

Figure 1: LED Display Panel

Switch	*Function*
ON - Switch	Turn on UPS system: By pressing the ON-Switch "I" the UPS system is turned on.
OFF-Switch	When mains power is normal, the UPS system switches to Standby mode by pressing OFF-Switch . It is then switched to Bypass and the inverter is off. At this moment, the output sockets are supplied with voltage via the bypass if the mains power is available.
Multi-Function Switch	When UPS system turned on, touch this button "Load capacity LED" and "Battery capacity LED" will shine by turns, then its capacity will be shown.

Display	*Function*
LINE mode LED	The LINE mode LED lights up if mains voltage is applied to the UPS input. LINE mode LED blinks when the phase and neutral conductor have been reversed at the input of the UPS system.
BAT mode LED	The BAT mode LED lights up when the mains power has failed and the inverter is being powered by the batteries.
BYPASS mode LED	The BYPASS mode LED lights up when the UPS system is supplying voltage provided by the mains power via the bypass.
FAULT mode LED	The FAULT mode LED lights up and an acoustic warning signal is issued continuously when the UPS system is in fault condition.
LOAD and BAT capacity LEDs	These LEDs show the load of the UPS system if the LOAD capacity LED light up: 1st LED 0-25% 2nd LED 26-50% 3rd LED 51-75% 4th LED 76-100% These LEDs show the battery capacity of the UPS system if the BAT capacity LED light up 1st LED 0-25% 2nd LED 26-50% 3rd LED 51-75% 4th LED 76-100%

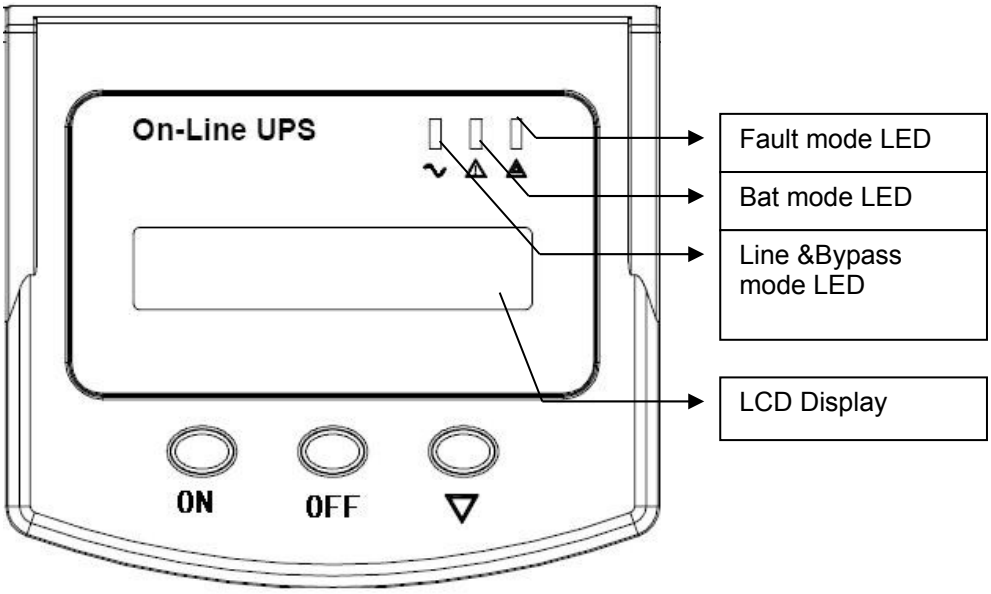

Figure 2: LED Display Panel

LCD display details as following:

- Welcome

  WELCOME TO USE
  GREEN POWER

- System status

  SYSTEM STATUS
  LINE MODE

- Input characteristic

  INPUT
  120Vac 60.0Hz

- Input characteristic

  OUTPUT
  120Vac 60.0Hz

- Battery characteristic

  BATTERY
  80.2V 100%

- Load and temperature

  LOAD TEMP
  25% 25℃

Note: the Line mode LED and the Bypass mode LED is the same LED in LCD panel UPS.

5. Connection and Operation

The system may be installed and wired only by qualified electricians in accordance with applicable safety regulations!

5.1 Connection and operation for 1K(L)1.5k(L)/ 2K(L)/ 3K(L)

When installing the electrical wiring, please note the nominal amperage of your incoming feeder

1) Inspection: Inspect the packaging carton and its contents for damage. Please inform the transport agency immediately should you find signs of damage.

   Please keep the packaging in a safe place for future use.

   Note: Please ensure that the incoming feeder is isolated and secured to prevent it from being switched back on again.

2) Connection:

   2.1) UPS Input Connection

   If the UPS is connected via the power cord, please use a proper socket with protection against electric current, and pay attention to the capacity of the socket: over 15A for 1~3K.

   2.2) UPS Output Connection

   Simply plug the load power cord to the output sockets to complete connection.

Model No.	**Output Socket (pcs)**	**Terminal Block**
NST3100010	2	Nil
NST3100020	3+1high current output	Nil
NST3100030	3+1high current output	Nil
NST3100050-L	0	1
NST3100060	0	1

   2.3) Computer Connection:

   Connect your computer to the outlet sockets of the UPS system following the above diagram.

Caution!
*Do not connect equipment which would overload the UPS system (e.g. laser printers)

3) Battery Charge: Fully charge the batteries of the UPS system by leaving the UPS system connected to the mains for 1-2 hours. You may use the UPS system directly without charging it but the stored energy time may be shorter than the nominal value specified.

4) Turn On the UPS:

4.1) With utility power connecting:

Connect the utility power UPS will get into the Bypass mode, the Bypass mode LED will light up. Press “ON” button continuously for more than 1 second to turn on the UPS. Then the UPS will get into self-test status first. After having finishing the self-test, the UPS will get into the inverter mode, at this time, the LINE mode LED will light up.

4.2) Without utility power connecting:

Even though utility power is not connected to the UPS, the UPS still can be turned on by just simply pressing “ON” button continuously for more than 1 second. Then the UPS will get into self-test status first. After having finishing the self-test, the UPS will get into the inverter mode, at this time, Battery mode LED, will light up.

5) Test Function:

Test the function of the UPS system by either pressing the On-Switch or disconnecting the input of the UPS system from the power supply.

6) Turn Off the UPS:

6.1) In Inverter Mode:

Press “OFF“ button continuously for more than 1 second to turn off the UPS. Then the UPS will get into self-test status first. After having finished the self-test, the UPS will get into bypass mode and Bypass mode LED will light up. At this time, the UPS might has output. Disconnect the utility power to turn off the output.

6.2) In Battery Mode:

Press “OFF“ button continuously for more than 1 second to turn off the UPS. Then the UPS will get into self-test status first. After having finished the self-test, the UPS will be turned off completely.

7) Audible Alarm Mute Function: If the alarm is too annoying in battery mode, you may press “ON” button continuously for more than 1 second to clear it. Moreover, the alarm will be enabled when the battery is low to remind you to shutdown the load soon.

8) Operation Procedure of External Battery for Long Backup time Model (“L” Model)

(1) Use the battery pack with right voltage. Connection of batteries more than or less than required will cause abnormality

(2) One end of the external battery cord is a plug for connecting the UPS and the other end has a plug for connecting the user battery cabinet

(3) Do not connect the UPS to any load yet. Then, connect the power cord of the UPS to supply utility power to the UPS to make the UPS operate in utility power mode.

(4) Connect the plug of the external battery cord to the external battery socket on the rear panel of the UPS to complete the connection procedure and the UPS will start to charge the battery pack.

6. Maintenance

6.1 Operation

The UPS system contains no user-serviceable parts. If the battery service life (3 - 5 years at 25°C ambient temperature) has been exceeded, the batteries must be replaced. In this case please contact your dealer.

6.2 Storage

If the batteries are stored in temperate climatic zones, they should be charged every three months for 1-2 hours. You should shorten the charging intervals to two months at locations subject to high temperatures.

7. Technical Data

7.1 Electrical specifications

INPUT

Model No.	1KVA	2KVA	3KVA	5KVA	6KVA
Phase	Single				
Frequency	50/60Hz				

OUTPUT

Model No.	1KVA	2KVA	3KVA	5KVA	6KVA
Power rating	1kVA/0.8kW	2kVA/1.6kW	3kVA/2.4kW	5KVA/4KW	6KVA/4.8KW
Voltage	220/230/240×1-2%VAC OR 110/115/120×1-2%VAC			220/230/240×1-2%VAC	
Frequency	50/60×1±0.3%Hz (Battery mode)				
Wave form	sinusoidal				

BATTERIES

Model No.	1KVA	2KVA	3KVA	5KVA	6KVA
Number and type	3×12V 7/9Ah	6×12V 7/9Ah	8×12V 7/9Ah	10×12V 9Ah	20×12V 7/9Ah

7.2 Operating Environment

Ambient Temperature	0 °C to 40 °C
Operating humidity	< 95%
Altitude	< 7000Feet
Storage temperature	0 °C ~ 40 °C

7.3 Dimensions and weights

Model No.	Dimensions W x D x H (mm)	Net Weight kg
1KVA	144X 420X215	16KG (3pcs batteries)
1KVA-L	144X 420X215	8
2KVA	191X475X340	31KG (6pcs batteries)
2KVA-L	191X475X340	18
3KVA	191X475X340	35KG (8pcs batteries)
3KVA-L	191X475X340	18
5-6KVA-L	213 X 475 X 340	18
5KVA	213 X 510 X 427	45KG (10pcs batteries)
6KVA	213 X 510 X 427	70KG (20pcs batteries)

the following standards:

EN62040-1-1 (safety)

Conducted Emission: EN50091-2.....Class B

Radiated Emission: EN50091-2.....Class B

Harmonic Current: EN61000-3-2

Voltage Fluctuations and Flicker: EN61000-3-3

EMS: EN61000-4-2(ESD).....Level 4

EN61000-4-3(RS) .....Level 3

EN61000-4-4(EFT).....Level 4

EN61000-4-5(lighting surge).....Level 4

EN61000-2-2 (Immunity to low frequency signals)

9. Communication Port

9.1 RS232 Interface

The following is the pin assignment and description of DB-9 connector.

Pin #	Description	I/O
2	TXD	Output
3	RXD	Input
5	GND	Input

9.2 AS400 Interface(Option)

Except for the communication protocol as mentioned above, this series UPS has AS400 card (an optional accessory) for AS400 communication protocol . Please contact your local distributor for details. The following is the pin assignment and description of DB-9 connector in AS400 card.

Pin #	Description	I/O
1	UPS Fail	Output
2	Summary Alarm	Output
3	GND	Input
4	Remote Shutdown	Input
5	Common	Input
6	Bypass	Output
7	Battery Low	Output
8	UPS ON	Output
9	Line Loss	Output

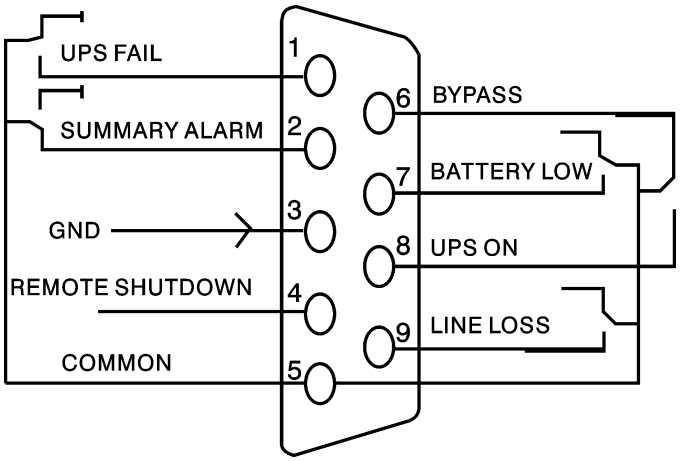

Figure 16.2: DB-9 Interface of AS400 communication protocol

10. Appendix 1 The Corresponding Form of the LED Display for 1-3K

No.	state		LED Display										Buzzer
			25%	50%	75%	100 %	load	bat	line	bps	bat	fault	
1	Load Capacity	0 ~25	●				●		↑	↑	↑		No sound
2		26 ~50	●	●			●		↑	↑	↑		No sound
3		51 ~75	●	●	●		●		↑	↑	↑		No sound
4		76 ~100	●	●	●	●	●		↑	↑	↑		No sound
5													
6	Battery capacity	0 ~25	●					●	↑	↑	↑		Buzzing every 1sec
7		26 ~50	●	●				●	↑	↑	↑		Buzzing every 4sec
8		51 ~75	●	●	●			●	↑	↑	↑		Buzzing every 4sec
9		76 ~100	●	●	●	●		●	↑	↑	↑		Buzzing every 4sec
10													
11	Bypass Mode		●	↑	↑	↑	↑	↑		●			Buzzing every 2min
12	Overload in line mode, change to Bypass		●	●	●	●	★			●		●	Buzzing continuously
13	Overload in line mode, Not change to bypass		●	●	●	●	★		●				Buzzing every 0.5sec
14	Line Fault		●	↑	↑	↑	↑	↑	★	↑	↑		↑
15	Overload in bat mode		●	●	●	●	★				●		Buzzing every 0.5sec
16	Overload in bat mode						★					●	Buzzing continuously
17	Over-temperature		●							↑		●	Buzzing continuously
18	Inverter abnormal			●						↑		●	Buzzing continuously
19	BUS voltage anomalies				●					↑		●	Buzzing continuously
20	Charging-V is too high					●				↑		●	Buzzing continuously
21	Bat-V abnormal		●	↑	↑	↑	↑	↑	↑	↑	★		↑
22	Line L and N changed		●	↑	↑	↑	↑	↑	★				Buzzing every 2min
23	Charging Board or battery Fault		●	↑	↑	↑	↑	↑	↑	↑	★	●	Buzzing every 1sec
24	O/P short		●	●								●	Buzzing continuously
25	Fan Fault		●		●				↑	↑	↑	●	Buzzing every 1sec

●: Solid ON ★ : Flash ↑ : LED display and alarm warning are dependent on other conditions.